

ABSTRACT OF THE DISCLOSURE

The invention disclosed herein provides fluorescence based methods for the determination of polyhydroxylated analyte concentrations as well as optical polyhydroxylate
5 analyte sensors and sensor systems. In particular, the invention provides methods of quantifying the abundances or concentrations of polyhydroxylate analyte by measuring changes in the fluorescence lifetimes. The methods of the invention are based on the observation that fluorescent sensor molecules capable of binding a polyhydroxylated analyte such as glucose have distinct fluorescent lifetimes depending upon whether they are in a
10 form that is either bound to analyte or a form that is not bound to the analyte. The distinct and measurable differences in the fluorescence lifetimes of the different fluorescent sensor species can be used to determine the relative abundance of the bound and unbound fluorescent sensor species, a parameter which can then be correlated to the concentration of the analyte.

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